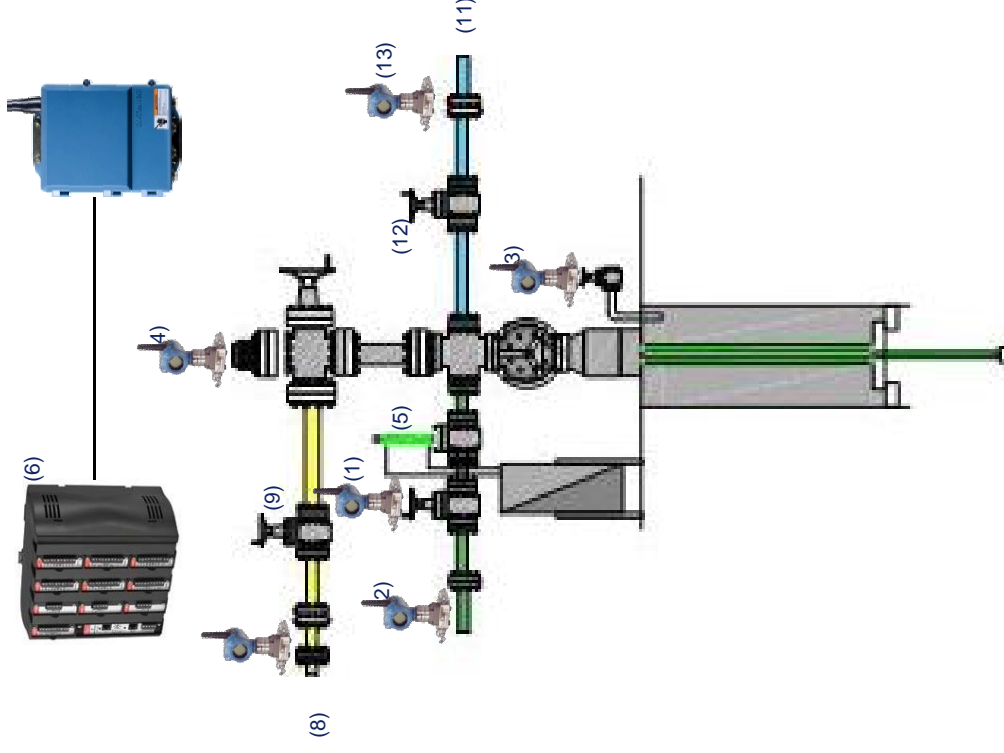


Oil Producing Well with Gas Lift and Water Wash (WW)

- Water Wash is periodically used on wells with Gas Lift to clear any sediment that may build up in the annulus.
- Emerson instrumentation can be located at the following additional measurement points:-
 - Water Wash Pressure ⁽¹¹⁾
 - Water Wash Differential Pressure ⁽¹¹⁾
 - Water Wash Control Valve ⁽¹²⁾
- Water Wash measurements can be from multi-variable devices such as the 3095MV or MVS205R ⁽¹³⁾.
- Water Wash can also have it's own dedicated flow computer such as the FloBoss 103 or FloBoss 107.
- Valve control can be accomplished using DVC or an Emerson actuator with either the flow computer or RTU.



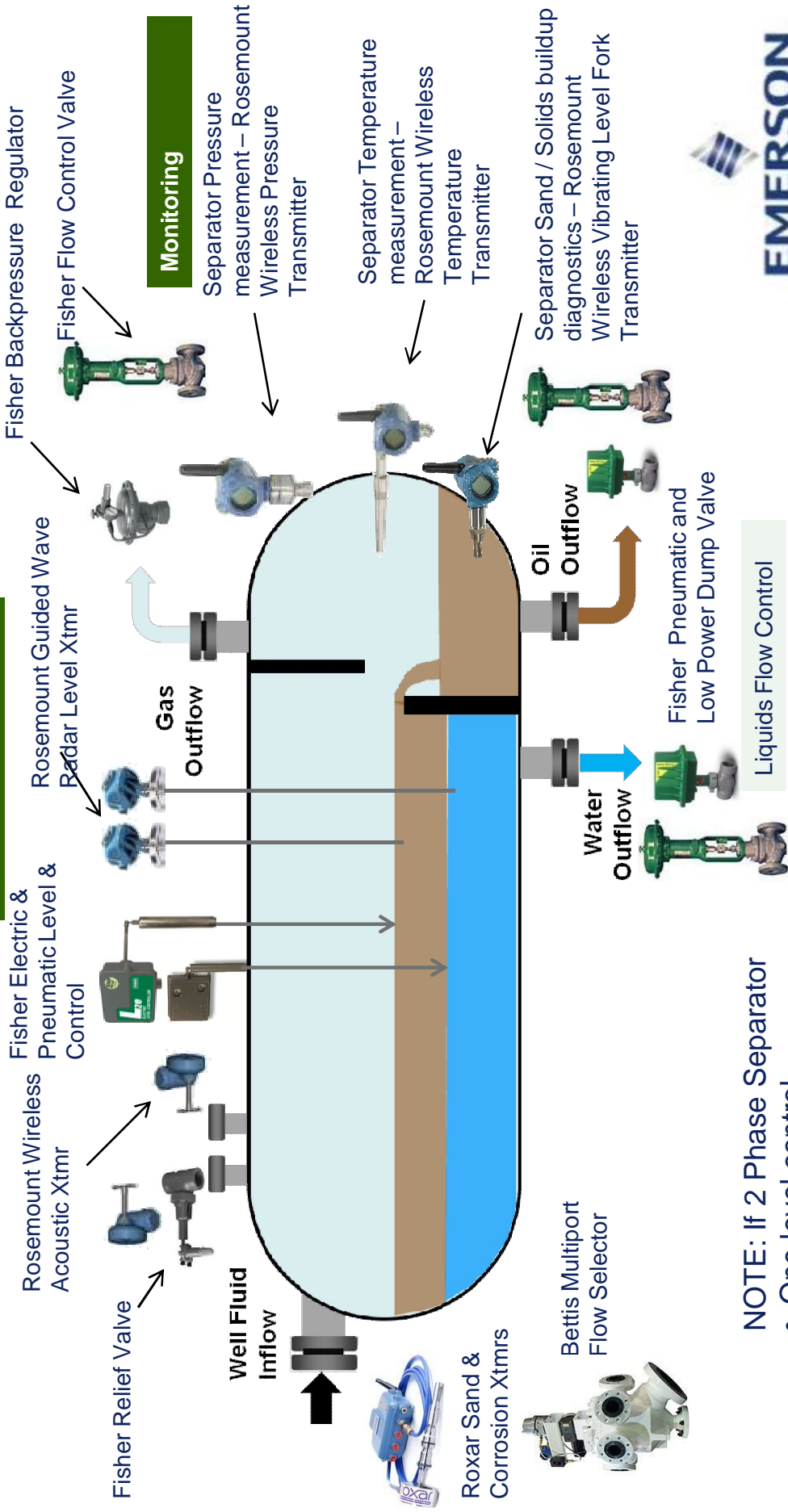
Smart Separator Control & Monitoring

Pressure Relief & Monitoring (primary & secondary)

Separator Oil, Water, & interface Level Control

Gas Flow Regulation

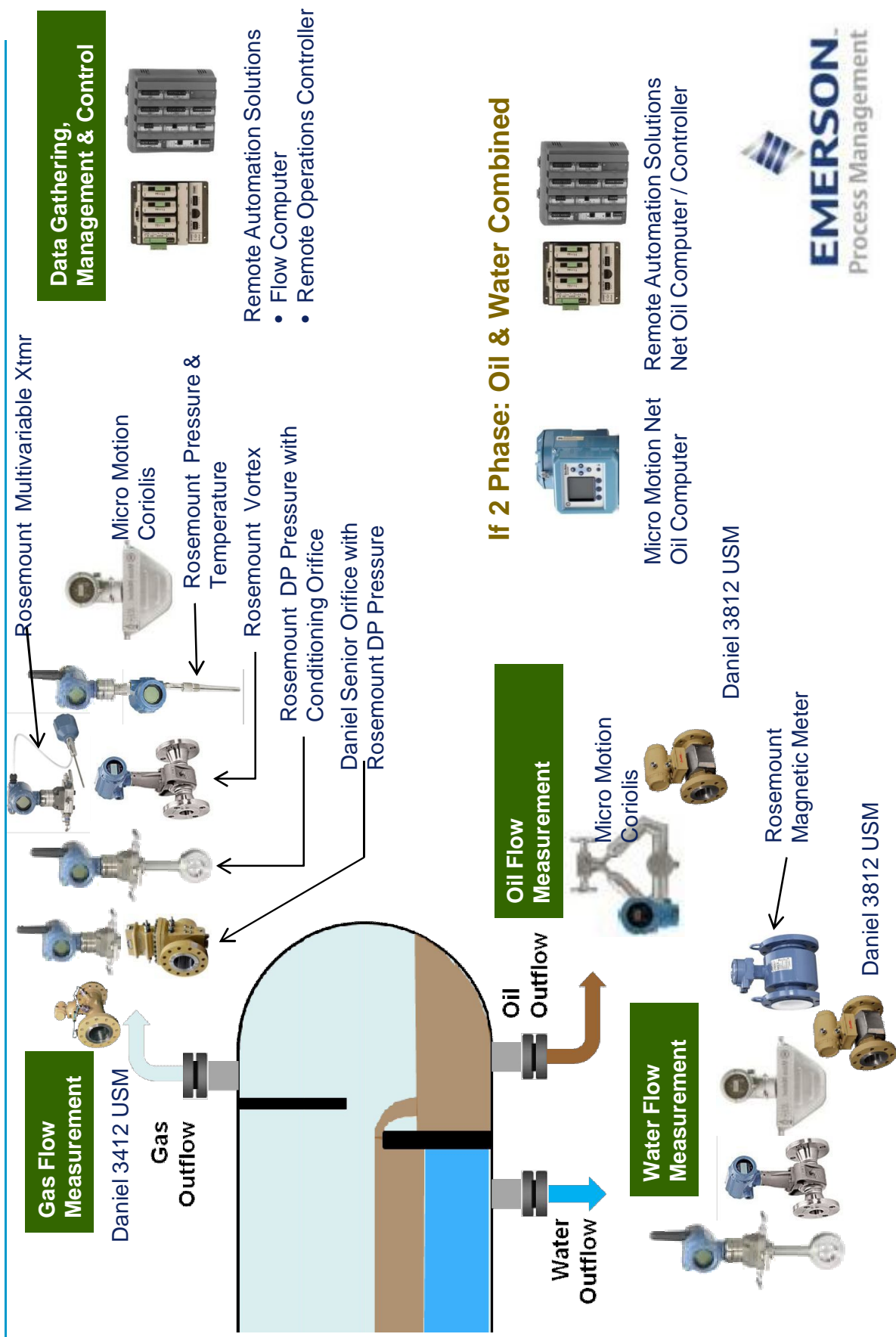
Monitoring



NOTE: If 2 Phase Separator

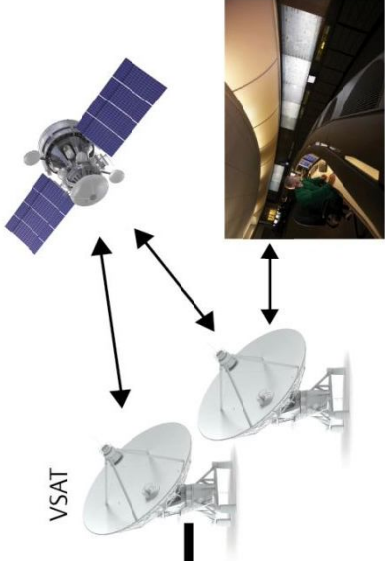
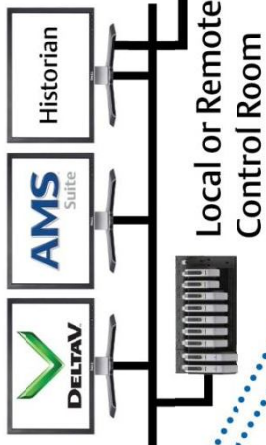
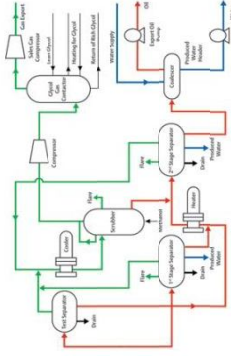
- One level control
- One Dump or control valve

Smart Separator Production Measurement

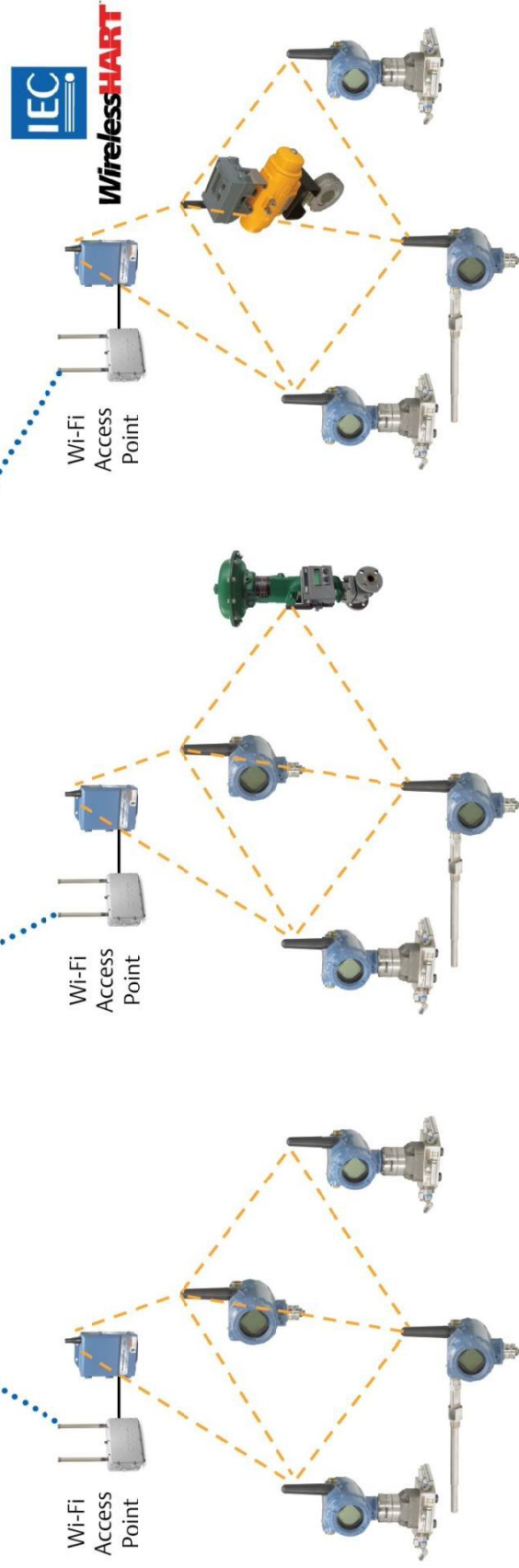


EMERSON'S SMART WIRELESS TECHNOLOGY USES FLEXIBLE NETWORKS TO COVER THE FULL EXPANSE OF THE INTELLIGENT FIELD

SEPARATION PROCESS



More Wellheads

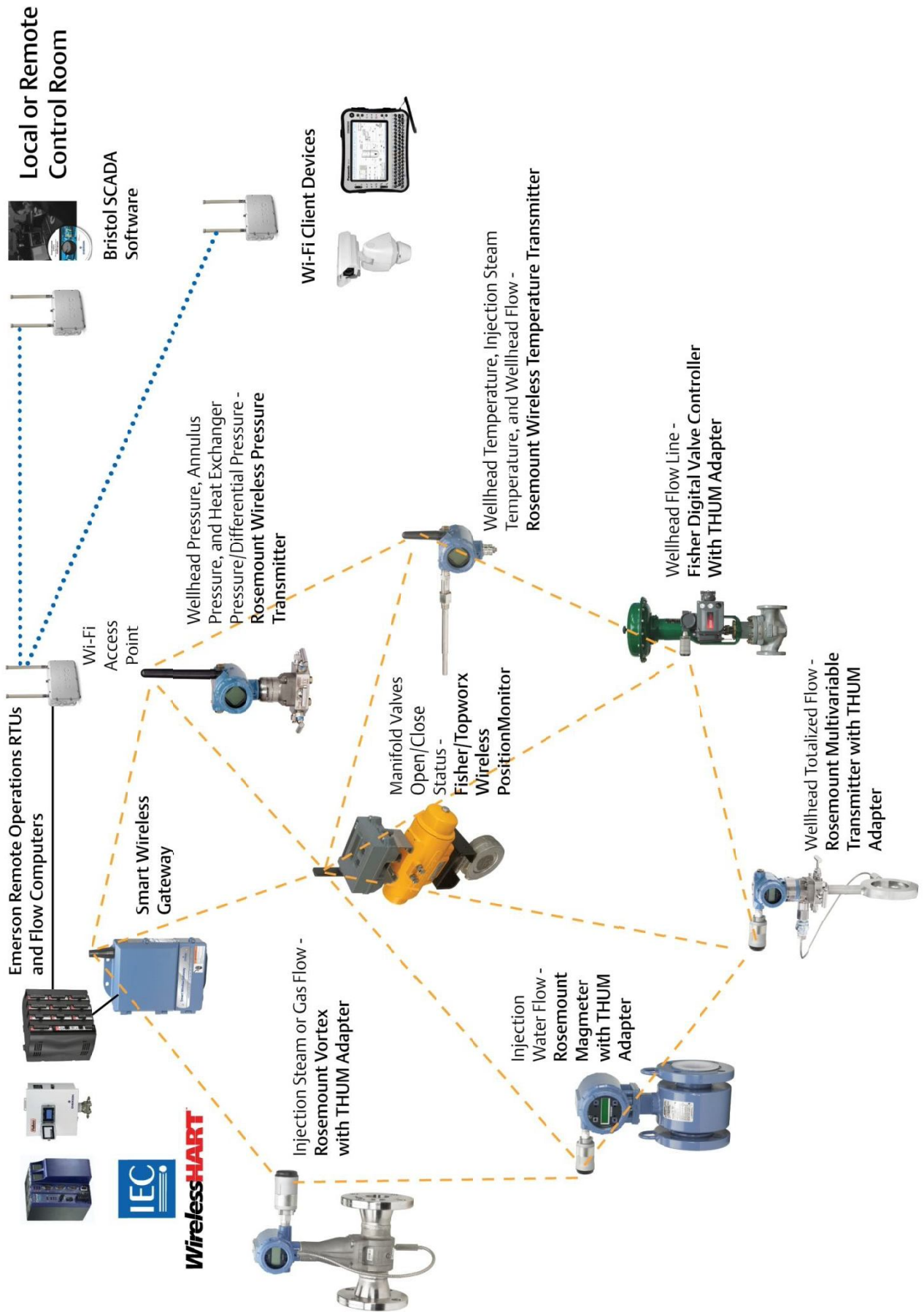


Wellhead Area 1

Wellhead Area 2

Wellhead Area 3

SMART WIRELESS NETWORKS DELIVER DATA FROM REMOTE WELLHEAD AREA



Wellhead Monitoring

WELLHEAD PRESSURE AND TEMPERATURE
Indicates health of well and composition of fluids

WELL ANNULUS PRESSURE
Indicates casing pressure – an increase indicates fluid leakage and need to relieve pressure or kill well

WELLHEAD FLOW
Measures temperature for use as an indirect indication of flow

WELLHEAD FLOW LINE VALVE DIAGNOSTICS
Wireless THUM Adapter transmits predictive diagnostics to aid maintenance

FLOW & NET OIL/WATER MEASUREMENT AT WELL
THUM Adapter transmits diagnostics for maintenance use and multiple process variables for monitoring

OIL PRODUCTION VALVE POSITION
Monitors open/close status and position of choke valves, wellhead valves, manifold valves, manual valves and shutdown valves

OIL PRODUCTION TOTALIZED FLOW
Multivariable transmitters efficiently calculate and provide totalized flow output

STEAM INJECTION HEAT EXCHANGER MANAGEMENT
Measures pressure and differential pressure across heat exchangers to monitor performance

WATER INJECTION FLOW
Measures and transmits water flow data and predictive diagnostics

STEAM OR GAS INJECTION FLOW
Measures and transmits steam or gas injection flow data and predictive diagnostics

GROSS OIL PRODUCTION
Gross production measured at headers to identify production losses

INJECTION WELLHEAD MONITORING
Pressure, temperature and DP flow measurements provide better visibility of injection process

Separator Monitoring

FLOW & NET OIL/WATER MEASUREMENT IN TEST SEPARATOR
THUM Adapter transmits diagnostics for maintenance and multiple variables for monitoring

SEPARATION PROCESS VALVE POSITION
Monitors open/closed status and position of manual valves, relief valves, tank inlet and outlet valves, and shutdown valves

VIBRATION IN INJECTION PUMPS
Monitors vibration of bases and bearings, providing data for predictive maintenance to improve availability

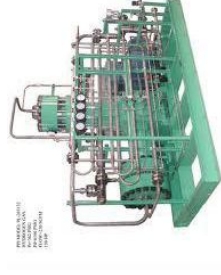
SEPARATOR LEVEL MEASUREMENT
Monitors Separator interface level and Knock Out drum level

SEPARATOR LEVEL ALARMS
High/Low alarm detection of Separator and Knock Out drum

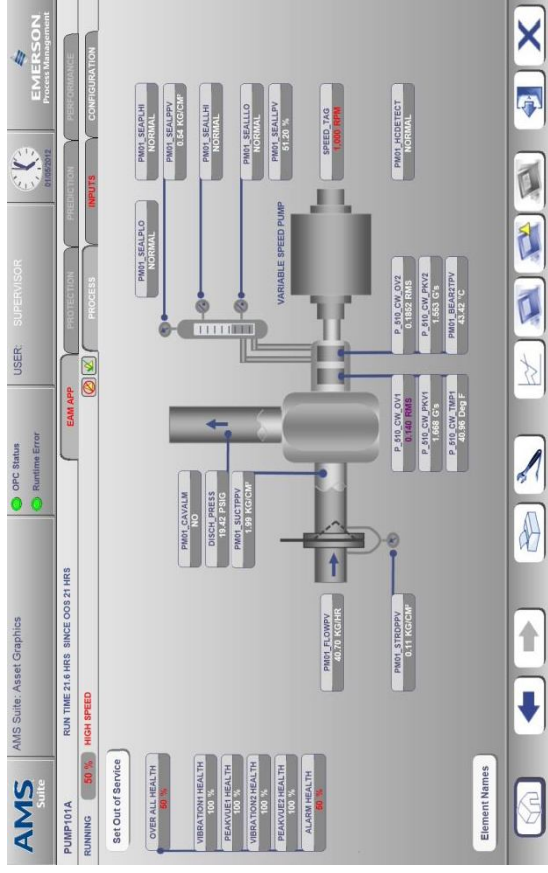
Wireless Essential Asset Monitoring

- Beyond individual device diagnostics

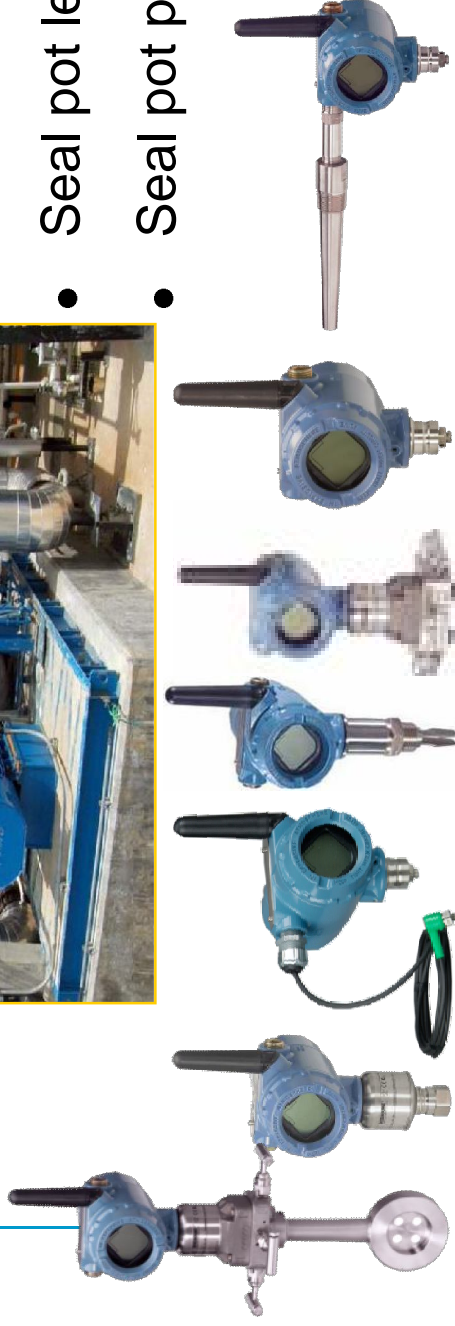
- Heat exchangers
- Pumps
- Blowers
- Fin fan coolers
- Simple compressors
- Cooling towers
- Fired heaters
- etc.



Pump Monitoring



- Plugged strainer
- Suction pressure drop
- Discharge pressure
- Cavitation
- Vibration
- Leak
- Bearings overheating
- Motor winding temperature
- Seal pot level
- Seal pot pressure

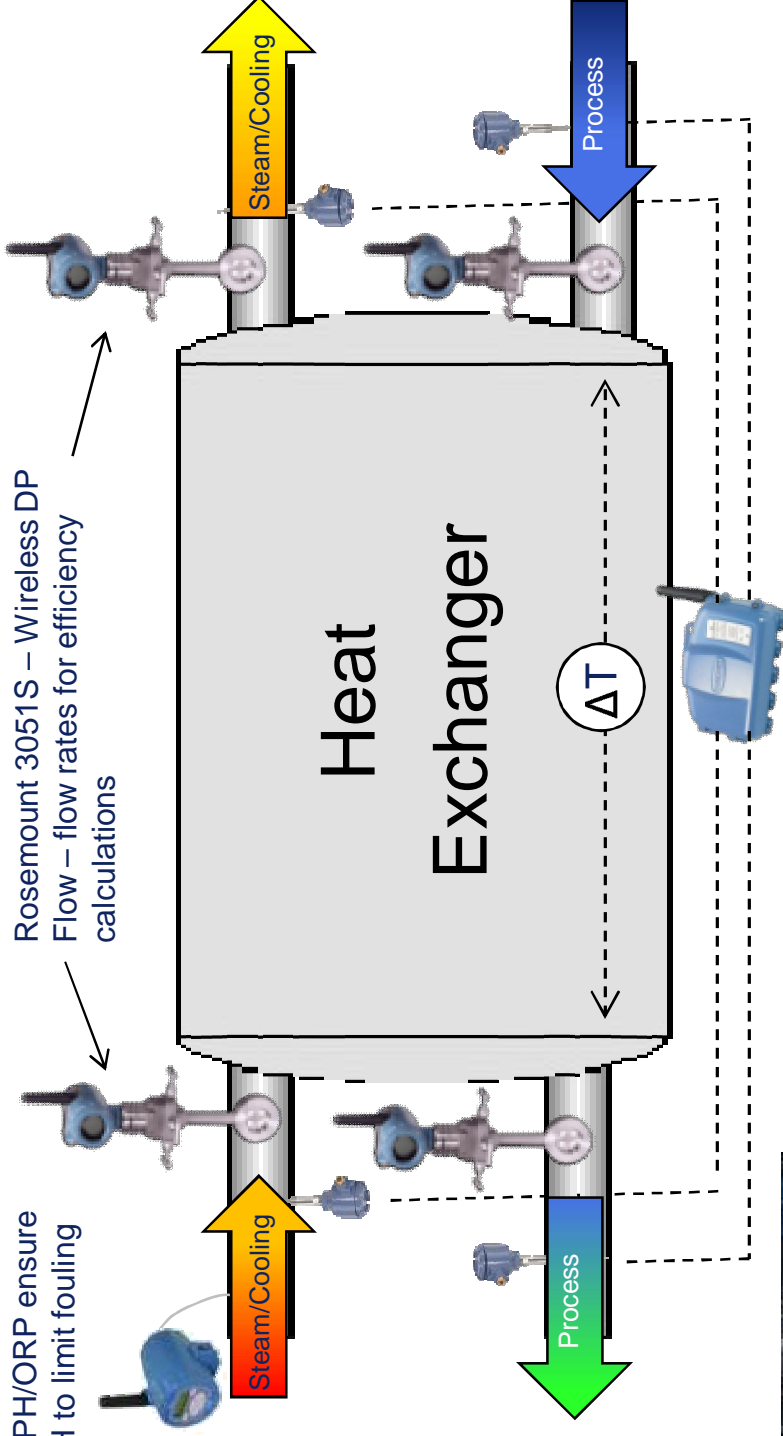


Heat Exchanger / Cooling Tower



Process Engineer

Rosemount 6081 –
Wireless PH/ORP ensure
proper pH to limit fouling



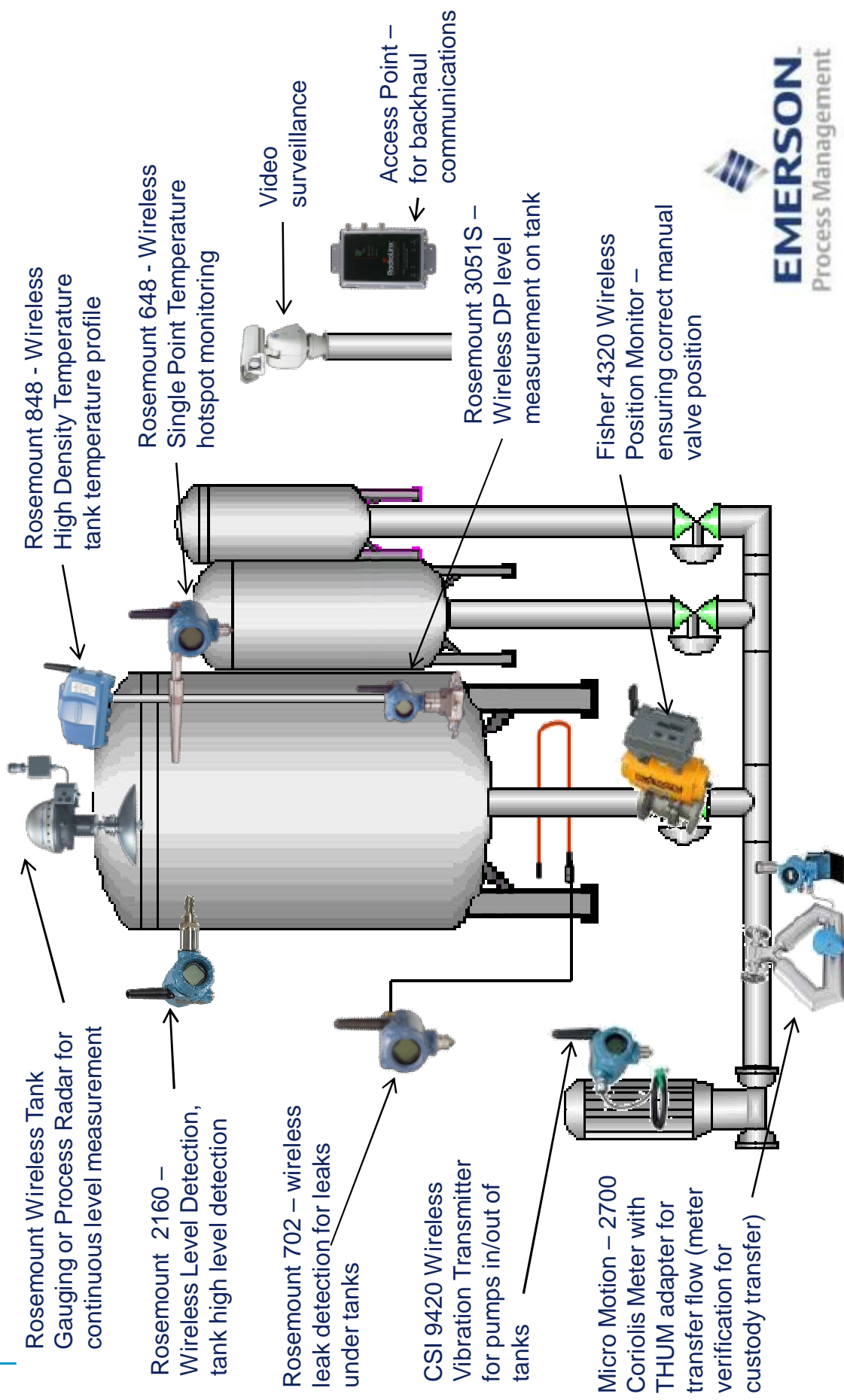
Rosemount 3051S – Wireless DP
Flow – flow rates for efficiency
calculations



Rosemount 848 - Wireless High Density Temperature
Rosemount 648 Wireless Temperature – temperatures for
efficiency calculations



Tank Monitoring



Wireless in Action



Oil & Gas Customers are Innovating with Smart Wireless Globally

Customer Name	Country	Industry/ Project	Application
StatOil Hydro 	Bergen Norway	Offshore Production (Wellhead monitoring)	Wellhead Annulus and Heat exchanger pressure
BP Wytch Farm 	Hampshire UK	Onshore Production (Oilfield Revamp)	Wellhead Annulus & Casing Pressure
Chevron (San Ardo) 	California USA	Onshore Production (Oilfield Revamp)	Injection Steam Flow & Downhole Pressure
Aera Energy (Bakersfield) 	California USA	Onshore Production (Oilfield Revamp)	Gross Oil Production Metering (Pressure, Flow)
PEMEX- Noch & AKAL-C 	Mexico	Offshore Production (Wellhead Upgrade)	Wellhead Annulus & Valve Positions
PDVSA Morichal Oilfields 	Morichal Venezuela	Onshore Production (Oilfield Revamp)	Wellhead Pressure, Temp. Flow monitoring
MMBF, -1 	Hungary	Onshore Production (Greenfield Facility)	Underground Gas Storage
Petronas Carigali 	Resak Malaysia	Offshore Production (Wellhead Upgrade)	Choke Valve Inlet & Outlet Pressure
Petronas Carigali 	Kumang Malaysia	Offshore Production (Greenfield Platform)	Wellhead Annulus & Casing Pressure